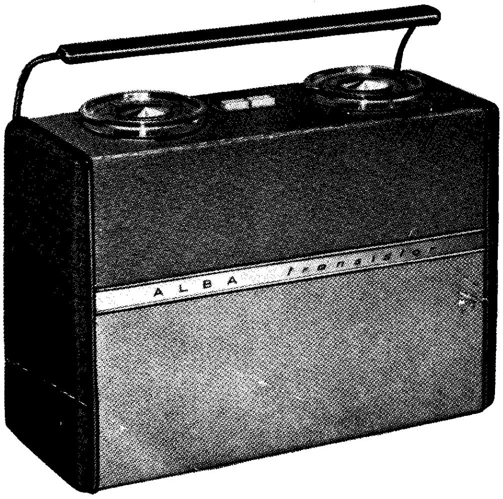
ALBA

SERVICE MANUAL

MODEL 44



GENERAL DESCRIPTION

The model 44 is a fully transistorised portable receiver designed for the reception of Medium and Longwave broadcasts. A ferrite-rod aerial is incorporated in the design and this should prove adequate for good reception in most areas. However, in areas of very low field strength; an external aerial may be beneficial and provision is made for this.

All components, except the loudspeaker, are mounted on the single printed-circuit chassis panel. The output transistors are carried in metal clips mounted on an aluminium sub-chassis; this metal sub-chassis forms a heat-sink for the output transistors and it is imperative that they are never operated unless their mounting clips are securely fastened to the sub-chassis.

Transistors:

T1-AF117(OC170) Mixer oscillator.
T2-AF117(OC170) 1st I.F. amplifier.
T3-AF117(OC170) 2nd I.F. amplifier.
T4(OC81D) Audio amplifier.
T5 } (OC81) Push-pull output.
T6 } Matched pair.

CIRCUIT DESCRIPTION

R.F.

Signals from the M.W. or L.W. aerial windings (L2 and L4 respectively) on the ferrite-rod are fed to the base of the mixer transistor T1 via the appropriate coupling winding (L1 or L3 respectively) and the wavechange switch. R.F. tuning is by means of section Ca of the gang, with Cta as the tracking trimmer. C1 is an additional fixed trimmer on L.W. T1 base is biased by the potential at the junction of R1/R2 via the coupling winding L1 or L3 and the wavechange switch.

The oscillator is formed by coupling T1 collector to the emitter via L7, L5 and capacitor C5. L6 is tuned by the oscillator section of the gang Co with Cto as the M.W. oscillator trimmer capacitor. Ct and C6 form additional oscillator trimmer capacity on L.W.

I.F.

The intermediate frequency is 470 Kc/s and L8/9 is the first I.F. transformer. I.F. signals from L9 are passed to the first I.F. amplifier T2. T2 is transformer coupled—via the second I.F. transformer—to the second I.F. amplifier T3. The third I.F. transformer has the diode detector, D2 (OA70), in its secondary circuit. Also in the third I.F. secondary circuit is a 0.02 μF capacitor which, together with R13 and C13, forms an I.F. filter network.

A.G.C.

A voltage, proportional to signal strength, is fed back, via R11, as an a.g.c. voltage. The effective range of the a.g.c. action is increased by the inclusion of the diode D1 (OA79) in the first I.F. circuit. Under weak or no signal conditions, this diode is cut off by the voltage across R6. The a.g.c. voltage, applied via L9 to the base of T2, rises with increasing signal strength causing a corresponding drop in T2 collector current. Since this current is drawn through R6, the voltage across R6 also decreases until a point is reached at which D1 conducts. R5 is then effectively connected across the first I.F.T., thereby greatly reducing the gain of this stage.

AUDIO

The audio signal is applied to the base of the driver stage T4 via the volume control, R14 and C14. The collector circuit of T4 is formed by the primary (L14) of the push-pull driver transformer. The two secondary windings of this transformer are connected so as to feed anti-phase signals to the output stage T5 and T6. The output transistors are connected in Class B single-ended push-pull and have the common load impedance formed by the 15 ohm speech coil. High frequency response correction is given by C16.

ALIGNMENT PROCEDURE

In order to carry out any alignment procedures, the chassis panel must be removed from the cabinet. Gently pull off both knobs and the tuning pointer. Lay the set face downwards and remove the back. Withdraw the battery and stand it beside the cabinet; remove the two screws from the lower corners of the chassis panel and gently withdraw the panel. This may now be inverted and laid across the cabinet. Disconnect the loudspeaker by means of the pull-off tag shown at the right-hand side of the component layout drawing. This will leave a 'spill' on the chassis panel to which may be connected one terminal of the output meter. The other side of the output meter should be connected to one end of the lead between loudspeaker and battery plug. Then proceed as in the following paragraphs. It is advisable to read through the instructions before commencing.

I.F. Alignment

(1) Set the output meter impedance switch to 15 ohms.

(2) Set the signal generator to 470 Kc/s with internal modulation on. Connect the generator output via a 0.1 µF capacitor to the base of the mixer transistor T1, i.e. to the pink lead from the ferrite-rod aerial assembly to the wavechange switch.

(3) Close the gang, switch set on and depress M.W. button (nearest to gang).

(4) Adjust L12 (3rd I.F.T.); L10-L11 (top and bottom respectively of 2nd I.F.T.); L8 (bottom of 1st I.F.T.), in that order, for maximum output. The signal generator output must be progressively reduced so that the maximum receiver output never exceeds 50 mW.

(5) Repeat (4) until no further improvement results and then check that an output of 50 mW may be obtained for an input of not greater than 3 µV.

(6) Switch the set off and remove the signal generator connection.

R.F. Alignment

(1) Before commencing the R.F. alignment, it will be necessary to provide a calibration scale for the gang capacitor. This may be done by either cutting out or tracing the outline drawing of the cabinet top including the tuning scale. Cut out the holes for the controls and stiffen the scale with strips of card and "Sellotape." Cut the slits where indicated and use these to locate the scale on the chassis panel by pressing the slits over the two tongues which locate the chassis in the cabinet.

(2) Connect the signal generator, via a 10K ohm resistor, to the aerial socket of the receiver. Check that the receiver is switched to M.W. then switch on.

(3) Tune the generator to 600 Kc/s, set the receiver tuner pointer to 600 Kc/s calibration mark and adjust L6-top (oscillator) and L2 (aerial) for maximum output.

(4) Retune generator to 1300 Kc/s. Set receiver tuner pointer to 1300 Kc/s calibration mark and adjust Cto (oscillator) and Cta (aerial) for maximum output.

(5) Repeat (3) and (4) until no improvement results then check that an output of 50 mW can be obtained at the frequencies and maximum generator output given in the following table:

Frequency	*Generator input*
600 Kc/s	115 µV
1 Mc/s	180 µV
1.3 Mc/s	170 µV
1.5 Mc/s	190 µV

(6) Depress the L.W. button (nearest to the volume control).

(7) Set the receiver pointer to 200 Kc/s calibration mark and adjust Ct for maximum output of B.B.C. LIGHT programme.

(8) Retune generator to 213 Kc/s. Tune in this signal on receiver and adjust L4 (aerial) for maximum output. Check that an output of 50 mW can be obtained for 40 µV input from generator.

(9) Switch off set.

NOTE: Although the full alignment procedure is given above, it is not anticipated that adjustment to L2 or L4 (aerial coils) will be necessary unless (a) a new aerial coil assembly has been fitted or (b) the stated sensitivity figures cannot otherwise be achieved. In either case, the adjustment is effected by sliding the appropriate coil along the ferrite-rod. After completion of alignment, seal the aerial coils on the rod with coil varnish. In case (b), the original factory varnish seal must be carefully broken before the coils can be moved along the rod.

A.G.C. Check

(1) Tune the receiver to 1300 Kc/s on M.W.

(2) Tune the signal generator to 1300 Kc/s and set its output level to 900 µV.

(3) Switch the set on and adjust the volume control to give a receiver output of 50 mW. Increase the generator output to 20 mV and ensure that the receiver output does not rise by more than 5.5dB. Switch off receiver. Switch off and disconnect the signal generator.

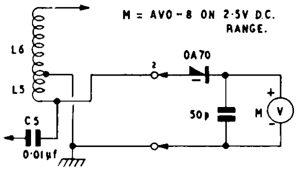
FAULT FINDING CHECKS

Consumption

With no signals being received, the total battery current should not exceed 12 mA.

Oscillator Check

Using an AVO Model 8 (or other meter having a sensitivity of 20,000 ohms per volt) and the rectifier circuit shown in the accompanying diagram, the meter reading for various tuner control setting on both wavebands should be approximately as given in the following table.



Rectifier circuit for oscillator check.

Waveband	*Gang position*	*Voltage*
M	Max. (closed)	0.12-0.23
	Mid.	0.13-0.25
	Min.	0.12-0.22
L	Max.	0.09-0.16
	Mid.	0.09-0.15
	Min.	0.08-0.15

Gain Check

The figures given in the following table give an approximate indication of the receiver gain over various stages. Except where stated otherwise, the set should be tuned to 600 Kc/s.

Generator freq.	*Injection Point*	*Rec'r output*	*Generator input (max.)*
470 Kc/s	Junc. D2/L13	5 mW	28 mV
470 „	Base T3	5 mW	800 µV
470 „	„ T2	5 mW	50 µV
470 „	„ T2	50 mW	100 µV
470 „	„ T1	50 mW	3 µV
600 „	„ T1	50 mW	3 µV
600 „	Across gang	50 mW	60 µV
213 „	Across gang with set retuned	50 mW	32 µV

MODIFICATIONS

On later models R19 and R21 have been changed from 2.7K to 2.2K

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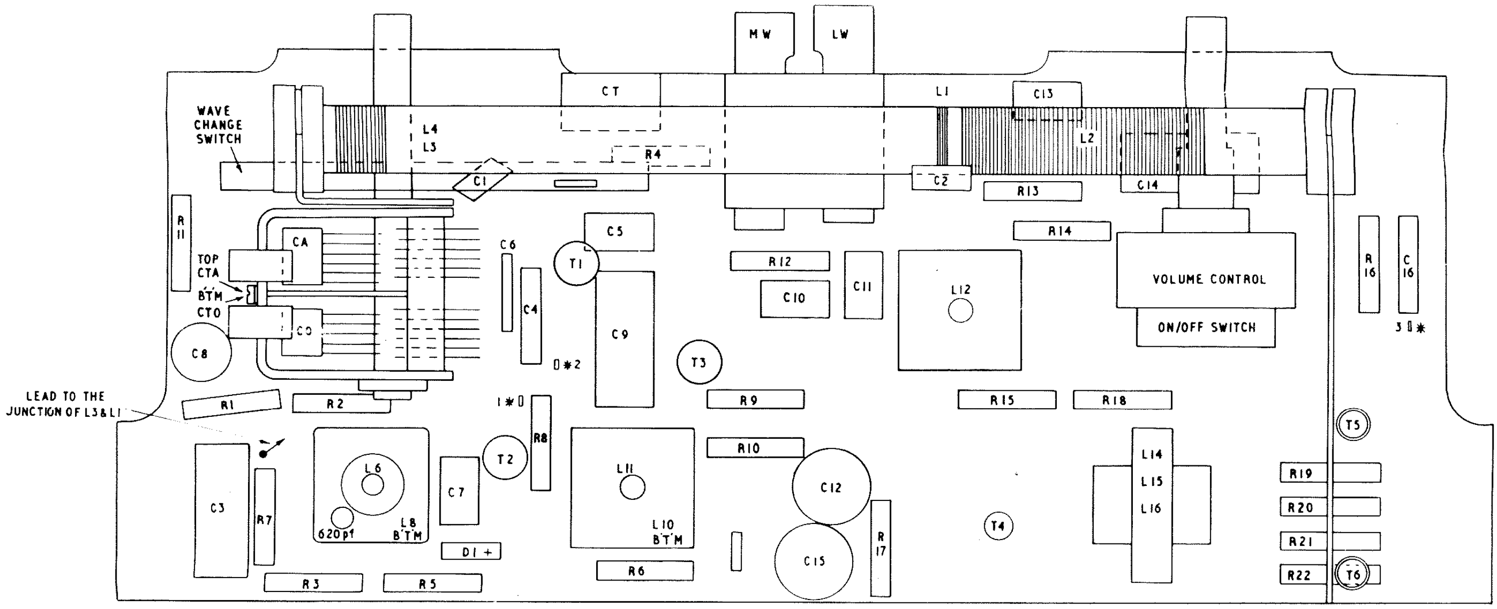
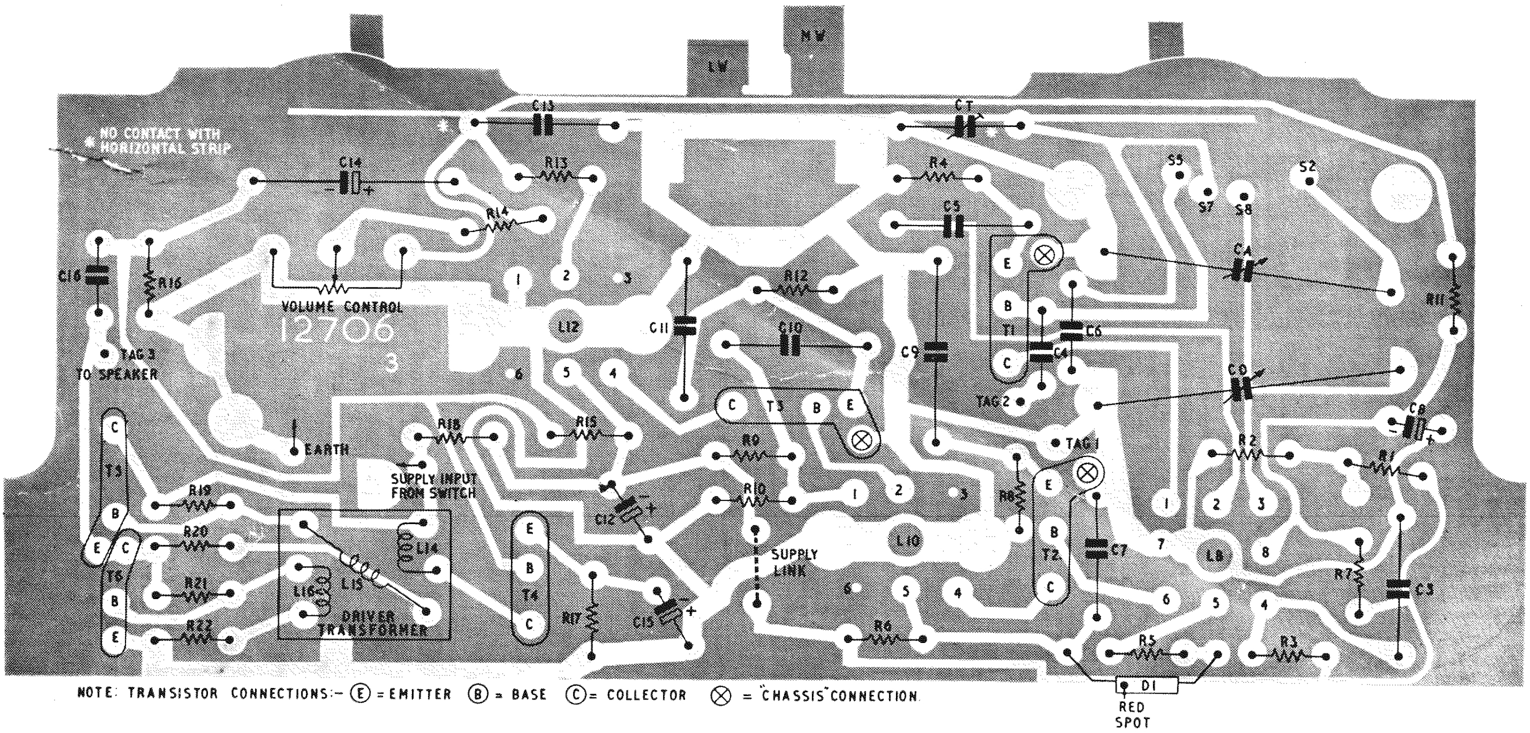


✱ PULL-OFF TAGS

Chassis panel: View showing component layout.

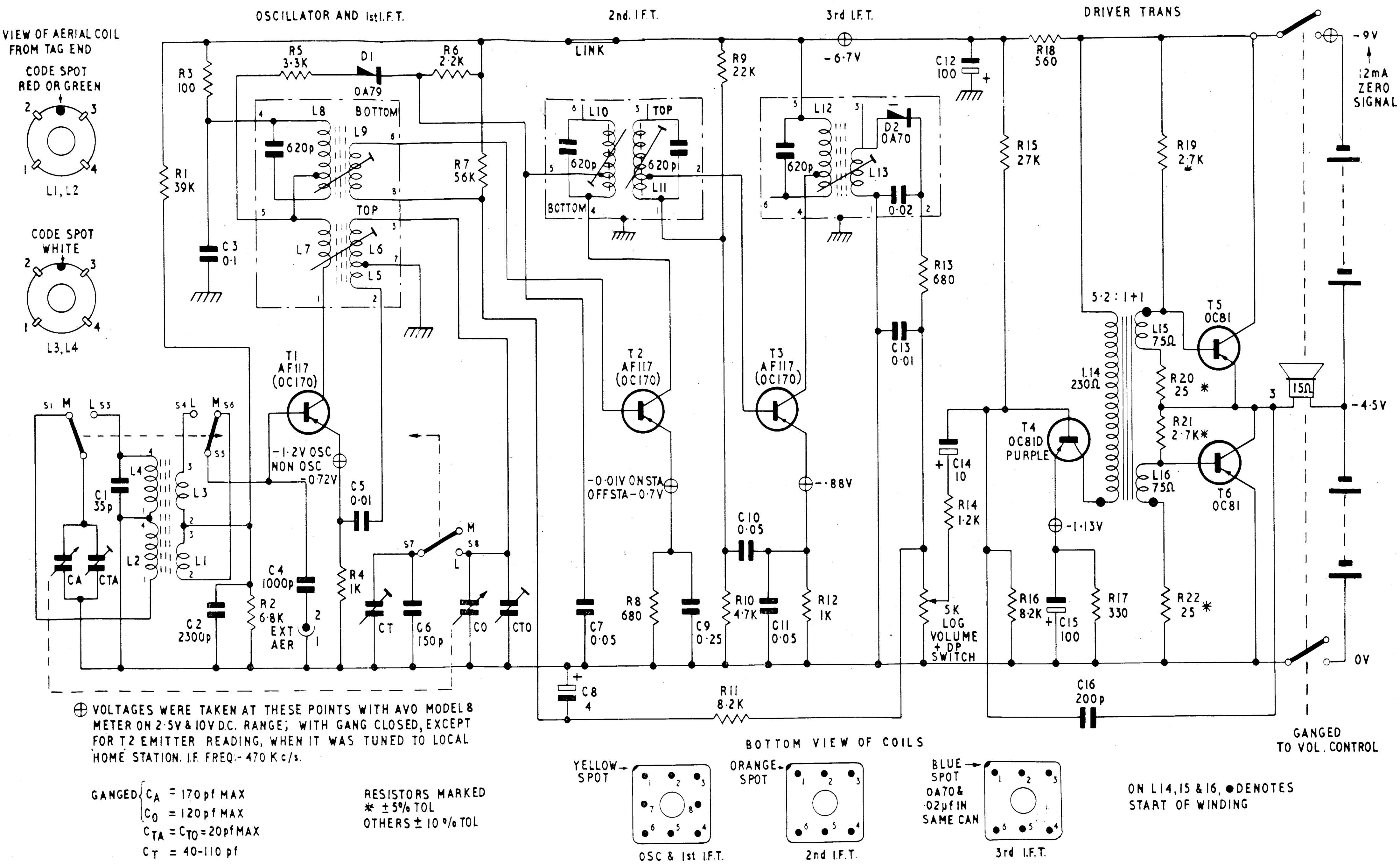


NOTE: TRANSISTOR CONNECTIONS:– Ⓔ = EMITTER Ⓑ = BASE Ⓒ = COLLECTOR ⊗ = "CHASSIS" CONNECTION

Chassis panel: View showing component connections.

SPARE PARTS

Item	*Pt. No.*
Printed panel	12706
Tuning knob	12707
Volume/On/Off knob	12708
Handle frame	12709
Moulded half (handle)	12710
Handle complete	12711
On/Off/Volume disc	12712
Tuning disc	12713
Cabinet (state colour)	12714
Heat sink plate	12715
Aerial support bracket	12716
Gang capacitor	12717
Volume control	12718
Wavechange switch	12719
Handle spacer	12720
2nd I.F. transformer	12723
3rd I.F. transformer	12724
Driver transformer	12725
Ferrite rod aerial assembly	12726
Speaker	12727
Battery plug	12728
Output transistor clip	12730
M.W. knob (state colour)	12737
L.W. knob (state colour)	12738
Pointer assembly	12739
Press button escutcheon	12744
Disc ornament in knob	12745
Aerial socket	12746
Fixing plate for aerial socket	12747
Oscillator coil/1st I.F. transformer	12750



⊕ VOLTAGES WERE TAKEN AT THESE POINTS WITH AVO MODEL 8 METER ON 2·5V & 10V D.C. RANGE; WITH GANG CLOSED, EXCEPT FOR T2 EMITTER READING, WHEN IT WAS TUNED TO LOCAL HOME STATION. I.F. FREQ:- 470 Kc/s.

GANGED C_A = 170 pf MAX
C_O = 120 pf MAX
$C_{TA} = C_{TO}$ = 20 pf MAX
C_T = 40-110 pf

RESISTORS MARKED * ±5% TOL
OTHERS ± 10% TOL

ON L14, 15 & 16, ● DENOTES START OF WINDING